



Pesticide Exposure and Potential Health Effects to Young Children Along the U.S. - Mexico Border

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The goal of the *Pesticides in Young Children - Border States Program* is to assess the relationship between health outcomes in children living along the United States - Mexico border and repeated pesticide exposures via multiple sources and pathways.

Phases of the Program



Phase I was designed to build capacity for subsequent studies by gathering baseline information on the potential for pesticide exposure.

Completed

Phase II identified characteristics of children highly exposed to pesticides and the factors which influence their exposures. These traits will be used to identify populations for future studies. In addition, techniques and methods to evaluate such populations were developed.

Completed

Phase III-A will identify a study population and provide a more complete monitoring of children classified with high end exposures including environmental measurements, biological monitoring for levels of specific pesticide compounds or their metabolites, and health outcome testing. Phase III-B, depending on results of other phases, may develop into an epidemiological study.

To Be Conducted

This approach is integrated, with each subsequent phase building on the results of earlier efforts.



PHASE ONE ACTIVITIES



Existing Data Survey

Texas, New Mexico, Arizona, and California

Collected data on pesticide usage, surveyed health clinics, collected methods for analysis of pesticides in environmental and biological media, and developed database of pesticide properties

Border Health Survey

Texas (Texas - Mexico border area)

Surveyed randomly selected households to collect demographic, health, and household structure data chemical testing performed for blood lead, hepatitis A, lead in pottery, and chlorine residual in water

Geographical Information Systems

Texas, New Mexico, Arizona, and California

Developed a common GIS format for the four border states, developed standard maps of the border areas showing temporal distributions of pesticide applications, locations of children, cropping patterns, etc.

Health Effects Symposium

El Paso, Texas

Held an interdisciplinary workshop to compile information on potential health endpoints measurable in young children, specific study designs proposed



PARTNERS



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| - U.S. Mexico Border XXI - Environmental Health Workgroup | - Texas Natural Resource Conservation Commission |
| - Mexico-EUA Frontera XXI - Grupo De Salud Ambiental | - University of Texas, School of Public Health at El Paso |
| - USEPA, National Exposure Research Laboratory | - New Mexico Department of Health Services |
| - USEPA, National Health and Environmental Effects Research Laboratory | - New Mexico Border Health Council |
| - USEPA, Region IX | - California Department of Health Services |
| - USEPA, Region VI | - Arizona Department of Health Services |
| - Centers for Disease Control and Prevention, National Center for Environmental Health | - University of Arizona, School of Public Health |
| - Border Health Clinics - 19 separated geographical locations | - Secretaria De Salud |
| - Texas Department of Health Services | - Seretaria de Medio Ambiente, Recursos - Naturales and Pesca |

For additional information see:
<http://www.epa.gov/orsearch/>

PHASE TWO ACTIVITIES



Arizona Border Study

The U.S.-Mexico border area of Arizona

Study provided a comparison of contaminants in environmental and biological media in a population based survey of the border region to the remainder of the State. The data helped prioritize environmental data for sampling

Insecticide Exposure and Immunological Effects

Imperial County, California

Study assessed clinical sample collection methods in 1-year-old children. Techniques for measuring possible immunological and developmental effects of pesticide exposure were also studied

Surveillance of Non-Occupational Acute Pesticide Illness - Texas

Study monitored the occurrence and distribution of pesticide related illness in Texas. Risk factors for non-occupational pesticide illness were identified and activities to reduce or prevent exposure were conducted

Pesticide Exposure of School Children

The Yuma, Arizona area

Study tested methods of selecting highly exposed children. Hypothesis is that children living or going to school near agricultural fields may be more highly exposed to OP pesticides

Children With Symptoms of Pesticide Exposure

Imperial County, California

Study evaluated the use of health clinics as a means to identify children with high exposure to pesticides. Children with potential symptoms of pesticide poisoning were tested

Techniques and Method Development Research

- ◆ Long-term time-integrated air monitoring
- ◆ Household pesticide inventory
- ◆ Dermal surrogates-baby wipes and cotton suits
- ◆ Urine collection for infants

PROJECT IMPACT



This research program has had a significant positive impact on our ability to identify children who have been exposed to pesticides, to quantify their exposures and to evaluate the source of exposure. Future work is expected to have an equally important impact on our ability to evaluate behavioral effects of these exposures. Results of this project provide direct regulatory support to OPPTS, as well as, the basis for further cooperative efforts.

Phase I projects brought together information from many sources to help evaluate perceived high level exposures associated with proximity to agricultural activity.

Phase II projects addressed community and regional concerns as part of the studies. An important aspect of our study design was the inclusion of pre- and post-study meetings with local groups, including medical professionals, public health officials, and parents. The success of this approach is reflected in the community willingness to support

and encourage participation in these projects aimed at developing methods for identifying those children most highly exposed to pesticides.

Phase III projects will evaluate the relationships between exposure to pesticides during development and health outcomes, with an emphasis on neurobehavioral endpoints in young children. This work is expected to have a significant positive impact on our ability to evaluate potential behavioral effects of exposure to environmental contaminants including pesticides.

